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| 10/757,794      | 01/13/2004  | Bruce M. Harper      | 004085.P036         | 5447             |

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| EXAMINER |
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NGUYEN, THUKHANH T

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| ART UNIT | PAPER NUMBER |
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1722

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/757,794

Applicant(s)

HARPER ET AL.

Examiner

Thu Khanh T. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/13/06</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Drawings***

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10-11 and 13 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nehring (6,705,853).

Nehring discloses a molding apparatus, comprising means or loading assembly (70) for loading or positioning a substrate (66B) into a molding frame and means for checking a drift of the substrate, or photoelectric sag sensors (108) for detecting sag/drift of a substrate panel (66A-B).

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In regard to the embossing foil, because this is a preform that will become part of the product, it does not add any positive structure limitation to the apparatus. Further, Nehring's apparatus is capable for use with an embossing foil, or a preform having a pre-embossed pattern in order to form a product having a desired pattern.

In regard to claim 11, the loading mechanism is capable of loading the substrate (66) at the center of the frame or at a predetermined position.

In regard to claim 13, Nehring further discloses heating elements (94, 102) for maintaining the temperature of the substrate (col. 6, lines 45-48).

4. Claims 10-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al (6,257,866) in view of Nehring (6,705,853) or in view of Nehring in view of Fritz et al.

Fritz et al discloses an apparatus for forming plastic sheet, comprising a molding cavity (20), a plurality of heating plate (50) for heating the material inside the cavity (20), a mold (14), which is equivalent to an embossing foil, a vacuum source and a pressure source for pushing or pulling the sheet material (12) or to prevent the , or a substrate, inside the mold cavity (20), wherein the apparatus inherently disclose means for loading the substrate (12) inside the mole cavity near the embossing mold (14).

Fritz et al, however, fails to disclose means for checking a drift of the substrate relative to the mold.

Nehring discloses a plastic forming apparatus as described above, including a sensor or photoelectric sag sensors (108) for detecting sag/drift of a substrate panel (66A-B).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Fritz et al by providing sensors as taught by Nehring for detecting the position of the forming sheet as the sheet is soften and deformed.

As explained above, the embossing foil is considered as a preform and add no structure limitation to the apparatus, claims 10-11, and 13 are anticipated by Nehring. In the alternative, when the embossing film is considered as a structure of a molding apparatus, Nehring fails to disclose an embossing film at the station where the sagging of the substrate is monitored.

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Nehring by providing an embossing film, or an imprinting mold in the heating chamber, or combine the heating and molding in one chamber as taught by Fritz et al, so that the sagging of the material can be determined relative with the mold cavity and the imprinting mold.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nehring ('853) as applied to claims 10-11 and 13 above, and further in view of Bailey et al (6,705,853).

Nehring discloses a sheet molding apparatus as described above, but fails to disclose means for repositioning the substrate.

Bailey discloses an imprint lithography apparatus for embossing a substrate, comprising a plurality of piezo actuators for repositioning the substrate as described above.

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Nehring by providing a plurality of piezo actuators for repositioning as taught by Bailey in order to reposition the substrate during the molding process.

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6. Claims 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bailey et al (US 2002/0115002 A1, or equivalent US Patent No. 6,696,220 B2) in view of Fritz et al (6,257,866).

Bailey et al disclose an apparatus for imprint lithography, comprising an embossing foil or an imprinted layer (16), a gas bearing nest to receive a substrate (col. 17, lines 30-43), and a plurality of piezo actuators (Fig. 51, 5103; col. 25, lines 17-37).

Bailey et al fails to disclose that the nest having a surface for supporting a substrate.

Fritz et al disclose a molding apparatus, comprising a sheet material (12), a mold cavity (20), an imprinting mold (14), a gas source (22) connecting to a nest, nest (18) having a gas bearing surface for supporting and controlling the position of the sheet within the mold cavity

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Bailey et al by providing a gas bearing source as taught by Fritz et al in order to control and regulate the sheet material within the mold cavity.

In regard to claim 15, Bailey further discloses a control computer (1113) connected to actuators (1112) for controlling the position of the substrate.

In regard to claim 16, Bailey discloses a push rod (Fig. 38, 3801).

In regard to claim 17, Bailey discloses that the actuators (3801, 5103) are used in a nano-imprinting lithography apparatus, therefore, these actuators are nano actuators. The current specification fails to provide a description of a nano actuator.

In regard to claim 18, the control computer (1113) is inherently comprises an actuator control algorithm as seen in Figures 21-22.

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In regard to claim 19, the gas bearing surface nest is inherently bounded by a wall, or the mold cavity (Fritz, 20) otherwise the gas would escape to the atmosphere, and depending on the pressure of the gas bearing, the substrate could be controlled to float on the gas bearing without contact the nest or the wall surface.

In regard to claim 20, the apparatus further comprise a disk (450, 460) having outer diameter to engage the plurality of piezo actuators (col. 51A-B, 5103 and the shaded area).

### ***Response to Arguments***

7. Applicant's arguments filed January 12, 2006 regarding claims 10-13 have been fully considered but they are not persuasive.

The Applicants argued that Nehring's apparatus failed to disclose a sag sensors in the molding station. However, this argument is not commensurate with the scope of the claim, which does not require that the apparatus is a molding system, and that the substrate positioning means and the sag sensors is located inside a mold cavity. The embossing foil has been interpreted as a) a preform that movable along with the substrate and will become part of the product, or b) part of the molding die. In regarding to the first option, since the embossing foil does not further define a positive structure of the apparatus, it cannot be used to determine the patentability of the apparatus claim. In regard to the second option, Fritz et al disclose an imprinting mold (14) for forming the substrate (12) within the mold cavity. It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Fritz in view of Nehring to provide the sensors to measure and regulate the position of

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the sheet, or substrate, during the molding process, or to provide Nehring with a mold as taught by Fritz et al so that the substrate can be imprinted at the heating station.

In regard to claims 14-20, Bailey et al disclose a X-Y stage for supporting the substrate, wherein the X-Y stage is provided with air bearing to prevent stiction and backlash of the wafer onto the supporting stage. It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Bailey by providing a gas source connecting to a bearing surface as taught by Fritz et al in order to control and regulate the position of the molding material or the substrate within the mold cavity.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu Khanh T. Nguyen whose telephone number is 571-272-1136. The examiner can normally be reached on Monday- Friday, 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TN

DUANE SMITH  
PRIMARY EXAMINER  
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3-20-06